

What is claimed is:

1. A method for automatic multi-level power management in an optical network, comprising the following steps, which are performed for each optical link in the optical network:

5 (a) determining node setpoint values for each node in the optical link so that the optical link meets predetermined power specifications;

10 (b) determining module setpoint values for each module of equipment within each node in the optical link so that the required node setpoint values of step (a) are achieved, otherwise generating a node level error signal; and

15 (c) dynamically changing equipment settings in each said module of equipment so that the module setpoint values of step (b) are achieved, otherwise generating a module level error signal.

2. A method as described in claim 1, wherein the step (a) of determining node setpoint values comprises determining node setpoint values at the egress of each node in the optical link.

20 3. A method as described in claim 1, wherein the step (b) of determining module setpoint values comprises determining module setpoint values at the egress of each module.

25 4. A method as described in claim 1, wherein the step (a) of determining node setpoint values comprises determining node setpoint values continuously.

5. A method as described in claim 1, wherein the step
(b) of determining module setpoint values comprises
determining module setpoint values continuously.

6. A method as described in claim 1, wherein the step
5 (a) of determining node setpoint values comprises determining
node setpoint values periodically.

7. A method as described in claim 1, wherein the step
(b) of determining module setpoint values comprises
determining module setpoint values periodically.

10 8. A method as described in claim 1, wherein the step
(a) of determining node setpoint values comprises determining
node setpoint values in response to a signal.

9. A method as described in claim 1, wherein the step
(b) of determining module setpoint values comprises
15 determining module setpoint values in response to a signal.

10. A method as described in claim 8, wherein the step
(a) of determining node setpoint values comprises determining
node setpoint values in response to the node level error
signal generated in the step (b).

20 11. A method as described in claim 8, wherein the step
(a) of determining node setpoint values comprises determining
node setpoint values in response to a signal generated by a
user.12. A method as described in claim 9, wherein the step
(b) of determining module setpoint values comprises
25 determining module setpoint values in response to the module
level error signal generated in the step (c).

13. A method as described in claim 9, wherein the step (b) of determining module setpoint values comprises determining module setpoint values in response to a signal generated by a user.

5 14. A method as described in claim 1, wherein the step (a) of determining node setpoint values further comprises determining whether the optical link in the optical network meets predetermined link specifications, and if no, then generating a link level error signal.

10 15. A method as described in claim 14, wherein the step of determining node setpoint values comprises defining the predetermined link specifications as predetermined optical-signal-to-noise-ratio for the link.

16. A system for automatic multi-level power management
15 in an optical network, comprising:

(a) a network level power management sub-system for determining node setpoint values for each node in an optical link in the optical network in order to meet predetermined power specifications for the optical link;

20 (b) a node level power management sub-system for determining module setpoint values for each module of equipment within each node in the optical link in order to achieve the required node setpoint values of sub-system (a), the node level power management sub-system comprising a node error means for generating a node level error signal; and

25 (c) a module level power management sub-system for dynamically changing equipment settings in each said module of

equipment in order to achieve the module setpoint values of sub-system (b), the module level power management sub-system comprising a module error means for generating a module level error signal.

5 17. A system as described in claim 16, wherein the network level power management sub-system comprises means for determining node setpoint values at the egress of each node in the optical link.

10 18. A system as described in claim 16, wherein the node level power management sub-system comprises means for determining module setpoint values at the egress of each module.

15 19. A system as described in claim 16, wherein the network level power management sub-system comprises means for determining node setpoint values in one of the following ways:
continuously;
periodically; and
in response to a signal.

20 20. A system as described in claim 16, wherein the node level power management sub-system comprises means for determining module setpoint values in one of the following ways:
continuously;
periodically; and
in response to a signal.

25 21. A system as described in claim 16, wherein the network level power management sub-system comprises means for

determining node setpoint values in response to the node level error signal generated in the sub-system (b).

22. A system as described in claim 16, wherein the node level power management sub-system comprises means for
5 determining module setpoint values in response to the module level error signal generated in the sub-system (c).